

Managing A Partnership Efficiently
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This paper examines an optimal control rights structure for dynamic partnerships, with an application to joint-ventures, R&D consortia, and cumulative innovation processes. Horizontal alliances in which partners jointly own an asset for multiple periods are a widespread form of partnership. An important aspect of these agreements is how the asset is shared among the partners over the life of the partnership, when they have differing valuations for the asset. I provide conditions under which a contract exists such that the asset is allocated efficiently among the partners in each period. The critical feature of this contract is that control rights of the partners should be flexible over the life of the partnership to ensure that allocation of the asset is ex-post efficient. Once the initial partnership is efficient, I show how the control rights should be adjusted over the lifetime of the alliance to prevent it from dissolving prematurely. The adjustments should be done in a way that gives more control to the partners who value the asset the most. In the absence of a technology spillover partners exert the socially optimal level of effort. One application of my model is the case of cumulative innovation. Suppose Firm 1 already holds a patent for an initial innovation. The patent breadth is exogenously determined by probability of infringement. Firm 2 can develop a sequential innovation, which makes the initial product obsolete. It may be a next generation drug, a next generation computer, a next version of software program, etc. Firm 1 can work on the improvement of the initial product as well. If the firms do not come to an agreement to cooperate, then Firm 2 undertakes some additional costly effort. The efforts can be additional research to differentiate the new product from the initial one, so that it would not infringe on the patent for the original product; or it may be the salary to lawyers working to determine whether a new product would infringe on an old one. If its effort is successful Firm 2 develops the product and earns positive profit. If not, Firm 1 develops an improvement. The first result of the paper implies that if the initial innovator is expected to have lower costs than others to develop subsequent innovations, he should get a broader patent to reduce the probability of infringement. On the other hand, as in the case of basic research, if the initial innovator is unlikely to develop subsequent innovations, the patent for the basic invention should be very narrow. This would force the earlier innovator to transfer exclusive rights to the subsequent innovator, given that the latter generates higher profit from using the patented innovation. Given the right patent protection, firms can engage in cumulative innovation in a socially efficient way without government intervention.

The paper also shows that with the right patent breadth, later innovators would finance basic research, even if the initial innovator is to own the patent on its invention. This is illustrated by the often observed practice of industry grants to university researchers. Moreover, the project would be undertaken whenever the expected value is higher than the expected cost.